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## REVIEWS

**Gager's Heredity and Evolution in Plants**

Under this comprehensive title, Dr. C. Stuart Gager has recently published a little book (P. Blakiston's Son & Co., pages xiii + 265, price \$1.25) of remarkable interest: remarkable in that it presents within so small a compass a digest of such broad and complex subjects.

The whole book may be summarized in a few lines. The reproductive system is the machinery for heredity; long-continued heredity is evolution; the results of evolution are expressed by the morphological differentiation of plants and by their distribution in space and time. Each of these themes is discussed by the author in turn.

Under the first head, the author devotes two chapters to the life history of a fern, wisely selecting for illustration a plant with well developed gametophyte rather than an angiosperm. The third chapter introduces some general considerations based on the facts presented in the two preceding, and discusses briefly but clearly the general nature of reproduction, alternation of generations, and reduction; this is followed by a general definition of inheritance and an entirely too brief discussion of the struggle for existence and the elimination of the unfit. Unfortunately this portion is marred by two rather serious errors or omissions.

The fourth chapter deals with the laws of heredity. Here the reviewer, who makes no pretence of erudition in genetics, at once came into difficulties. On page 40, inheritance is defined as "the recurrence in successive generations of a similar cellular constitution," while on page 48 the statement is made that inheritance is "all that an organism has to start with. It is the protoplasmic substance, with all its potentialities, passed on from parent to offspring." Now thorns recur on successive generations of roses, agreeing with the first definition, but a young rose does not have thorns to start with. Would it not have been just as clear to the general reader if inheritance had been defined as the potentiality of the protoplasmic substance passed on from

parent to offspring? The author then shows the distinction between inheritance and expression of heredity, and passes on to chapter 5, the experimental study of heredity. About half of this is devoted to an exposition of the well known work of Mendel and the rest to the work of Johannsen and Weismann, including a statement of the general unsolved problems developed as a result of their investigations.

Chapters 6 and 7 discuss the general nature of evolution, which is regarded as the major problem of botany, describing the ideas of Agassiz and Lamarck briefly and those of Darwin and Wallace in greater detail. These two chapters impress the reviewer as unusually well written. Chapter 8, on experimental evolution, is devoted almost entirely to a summary of the methods and results of De Vries' experiments and to the mutation theory in general.

The second half of the book deals with the results of evolution in plants, attempting to present modern ideas on the genetic relations of plants and on the phylogeny of angiosperms in particular, utilizing evidence from the comparative morphology and life history of living plants, from geographical distribution, and from the structure and chronological succession of fossil forms. The author inclines strongly toward Bower's ideas, but tries to present all sides of the question impartially. The 44 pages devoted to geographical distribution make an excellent compendium of the whole subject, presenting not the actual facts of modern distribution but rather the general nature and dynamics of the subject, basing the whole on the migration of seeds and proceeding to a discussion of endemism, discontinuous distribution, and the age and area hypothesis.

A shorter chapter deals with some of the general principles derived from a study of fossil plants, beginning with the conditions of fossil formation, presenting a general statement of the distribution of plants in time, and discussing in interesting fashion the causes of the extinction of species.

In chapter 12 the fossil seed-bearing ferns are discussed in more detail, particularly the Cycadeoidea, which are accepted by the author as the immediate progenitors of angiosperms, following the views of Arber and others, which are presented in inter-

esting and critical form. Polycotyledony is regarded as more primitive than dicotyledony, in agreement with the recent work of Bucholz, and the monocotyledons are derived from the Ranalian plexus. Due attention is of course given to other theories. The final chapter presents in tabular form the names and classification of the main groups of plants, with the angiosperms placed in practically the Engler and Prantl sequence. A brief bibliography and index occupy the remaining pages.

In general, the book is both interesting and readable. It is modern in including recent developments in botanical science, fair in presenting different controversial views, and satisfactory in inclining to one view while recognizing the claims of others. Unfortunately, typographical errors are frequent.

H. A. GLEASON

#### NEWS ITEMS

Contributors will please note that Mr. Norman Taylor, who has been the editor of *TORREYA* for the last ten years has resigned that position. Mr. George T. Hastings of 7 Robbins Place, Yonkers, N. Y., has been elected editor and all matters relating to *TORREYA* should be sent him.

Dr. and Mrs. N. L. Britton, accompanied by Dr. F. J. Seaver, have sailed for Trinidad where exploration of that island and adjacent regions will be carried on.